UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 14, 2003

MEMORANDUM TO: Janet R. Schlueter, Chief
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

FROM: Robert M. Latta, Sr. On-Site Licensing Representative
Repository Site Section
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Jack D. Parrott, Sr. On-Site Licensing Representative
Repository Site Section
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

SUBJECT U.S. NUCLEAR REGULATORY COMMISSION ON-SITE LICENSING REPRESENTATIVES' REPORT ON YUCCA MOUNTAIN PROJECT FOR JANUARY 1, 2003, THROUGH FEBRUARY 28, 2003

The purpose of this memorandum is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (ORs) report for the period of January 1, 2003, through February 28, 2003.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The ORs continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTIs) and their resolution. During this reporting period, the ORs continued to observe activities associated with Yucca Mountain site activities, KTIs, and audits. The ORs also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

If you have any questions on this report or its attachments, please call Robert Latta on (702) 794-5048, or Jack Parrott on (702) 794-5047.

Attachment(s): 1. U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report, Number OR-03-01, for the Reporting Period of January 1, 2003 Through February 28, 2003

2. Figure 1: ESF/ECRB Plan View Alcove, Niche and Borehole Testing Locations

3. U.S. NRC On-Site Licensing Representatives' Tracking Report for Open Items

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The purpose of this letter is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (ORs) report for the period of January 1, 2003, through February 28, 2003.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The ORs continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTIs) and their resolution. During this reporting period, the ORs continued to observe activities associated with Yucca Mountain site activities, KTIs, and audits. The ORs also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

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U.S. NUCLEAR REGULATORY COMMISSION

ON-SITE LICENSING REPRESENTATIVES' REPORT

NUMBER OR-03-01

FOR THE REPORTING PERIOD OF JANUARY 1, 2003 THROUGH FEBRUARY 28, 2003

/RA/

Robert M. Latta
Sr. On-Site Licensing Representative
High-Level Waste Branch
Division of Waste Management

/RA/

Jack D. Parrott
Sr. On-Site Licensing Representative
High-Level Waste Branch
Division of Waste Management

Reviewed and Approved By: **/RA/**

Larry Campbell
Section Leader
Repository Site Section
High-Level Waste Branch
Division of Waste Management

Enclosure

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ACRONYMS AND ABBREVIATIONS

ACRO	TITLE
AP	Administrative Procedure
ATC	Alluvial Tracer Complex
BSC	Bechtel SAIC Company, LLC
CAR	Corrective Action Report
the Center	Center for Nuclear Waste Regulatory Analyses
CSO	Chief Science Office
CT	Confirmation Team
DOE	U.S. Department Of Energy
DR	Deficiency Report
ECRB	Enhanced Characterization of the Repository Block
ESF	Exploratory Studies Facility
EWDP	Early Warning Drilling Program
FY	Fiscal Year
HLW	High-Level Waste
ITP	Installation Test Plan
KTI	Key Technical Issue
LA	License Application
MII	Management Improvement Initiative
NMSS	Nuclear Materials Safety and Safeguards
No.	Number
NRC	U.S. Nuclear Regulatory Commission
NTS	Nevada Test Site
NUREG	Nuclear Regulatory Guide

ACRONYMS AND ABBREVIATIONS - continued -

ACRO	TITLE
OCRWM	Office of Civilian Radioactive Waste Management
OPPD	OCRWM Program Procedures Database
OR	On-Site Representative
ORD	Office of Repository Development
OQA	Office of Quality Assurance
QA	Quality Assurance
QARD	Quality Assurance Requirements Description
SCWE	Safety Conscious Work Environment
SWO	Stop Work Order
TSPA-LA	Total System Performance Assessment - License Application
TWP	Technical Work Plan
USGS	United States Geological Survey
YMP	Yucca Mountain Project
YMSCO	Yucca Mountain Site Characterization Office

EXECUTIVE SUMMARY

MANAGEMENT IMPROVEMENT INITIATIVE CONFIRMATION REVIEW PROCESS

During this reporting period the On-Site Representatives' (ORs) evaluated the initial results of the Management Improvement Initiative (MII) Confirmation Team (CT). The Office of Civilian Radioactive Waste Management (OCRWM) established the CT to provide a mechanism to determine the status of the overall program implementation and MII completion. The MII identified that a review and closure process would be instituted to ensure the action plans were implemented and effective in improving performance.

No items of concern were identified as a result of the ORs review of the documentation associated with this activity, and it was generally concluded that the confirmation packages established an effective baseline for demonstrating that the MII items have been completed. However, it was noted that the CT activities were limited to verifying and documenting the completion of specific management actions, and that the overall effectiveness of the process improvements related to the MII has not been established.

OBSERVATION OF PROCEDURE DEVELOPMENT SURVEILLANCE OQA-SI-03-014

In order to evaluate the effectiveness of the MII Program Procedure improvement process, the ORs observed selected aspects of the U. S. Department of Energy (DOE's) Office of Quality Assurance (OQA) surveillance (OQA-SI-03-014), of the procedure realignment process. The purpose of this surveillance was to review the recently issued Bechtel SAIC Company, LLC (BSC) procedure BSC-AP-ATS-0001, "Procedure Development and Use," for compliance with the requirements of the Quality Assurance Requirements and Description (QARD). As a result of OQA's review of the procedure change documentation for BSC-AP-ATS-0001, numerous errors and omissions were identified including examples of failure to comply with the requirements of the QARD, and an apparent Safety Conscious Work Environment (SCWE) issue involving the directed release of this document containing known errors and potential procedural deficiencies. The surveillance team determined that there was an ineffective transition plan which resulted in the disruption of quality affecting work, and that BSC's Administrative and Support Services approved "blue sheet change notices," used to take ownership of approximately 97 quality affecting procedures, without appropriately established procedural controls.

Based on the safety significance of these issues, OQA initiated a Stop Work Order (SWO) No. BSC (O)-03-C-097, on March 4, 2003. Subsequent to the issuance of the SWO, OQA initiated Corrective Action Request (CAR) No. BSC (O)-03-C-097, which documented that contrary to the requirements of the QARD and AP-5.1Q, "Plan and Procedure Preparation, Review, and Approval," BSC failed to effectively implement the procedure development processes during the preparation, review, and approval of BSC-AP-ATS-0001, and related processing of procedures. The CAR also concluded that procedure BSC-AP-ATS-0001, was not acceptable for use based on the significant condition adverse to quality identified by OQA's surveillance team.

As a result of the ORs documentation reviews and discussions with the surveillance team, it was noted that three significant issues identified during the surveillance were not specifically addressed within the context of CAR BSC (O)-03-C-097. These issues involve: 1) identification of the lack of procedural training as a contributing factor; 2) failure of BSC to develop an effective transition plan; and 3) an apparent SCWE issue related to the directed release of a

quality affecting document with known errors and potential procedural deficiencies. Therefore, pending the documentation of these issues on separate Deficiency Reports (DRs) and the effective resolution of concerns related to inadequate personnel training, the failure to establish an effective transition plan, and the evaluation of SCWE issues, this item is identified as **OR Open Item 03-01**.

MII COMPLETION STATUS

There are 29 discrete action statements associated with the 5 MII key areas. Additionally, there are approximately 36 action statements related to CARs BSC-01-C-001 (Models) and BSC-01-C-002 (Software). Based on the MII implementation schedule, 25 of these actions were to be completed by December 2003. However; as of the end of January 2003, only about 50% of the milestones established in the MII were reported, "completed on time," and the percentages of action statement summary sheets submitted as final for DOE and BSC were approximately 30% and 50%, respectively. Enhanced performance indicators associated with the MII are still under development.

Corrective actions related to CARs BSC-01-C-001 and BSC-01-C-002 are currently behind schedule and the management imposed stand down on software development remains in place with no established date for concluding this administrative process which has been in effect for approximately 18 months. CAR BSC-01-C-001, which has been open for more than 640 days, has 4 actions that are overdue and CAR BSC-01-C-002, which has been open for more than 600 days, has 15 actions that are overdue.

Although effective self-identification of deficiencies is an implicit aspect of the MII, current indication is that the line organization identified items have declined from the targeted value of 50%. The current value for self-identified items is approximately 25%. There also appears to be a high threshold and a reluctance to document nonconformances on DRs.

GENERAL SITE ISSUES

On January 9, 2003, a standing order was issued by the Site Operations Project Manager giving notice of a safety stand down for all electrical work at the Yucca Mountain site. This stand down was based on safety and quality concerns. On January 13, 2003, smoke was detected in the Enhanced Characterization of the Repository Block (ECRB) behind the bulkhead at Station 22+01. An investigation identified burnt wiring between the bulkheads at Stations 22+01 and 25+01 as the cause of the smoke.

EXPLORATORY STUDIES FACILITY TESTING

During this reporting period, the drift-scale thermal test continued its cool-down phase. Periodic video inspections of the drift-scale thermal test canisters have revealed small marks, on several of the simulated canisters, that have appeared since the initiation of the cool-down phase. DOE is investigating the source of these marks. DOE has also begun preparations for Phase I of a ground support test in the south ramp of the Exploratory Studies Facility (ESF).

ENHANCED CHARACTERIZATION OF REPOSITORY BLOCK TESTING

Entries beyond the sealed bulkhead at Station 22+01 were scheduled during this reporting period, however, problems in the Enhanced Characterization of Repository Block (ECRB) due to burnt wiring and high levels of radon have delayed these entries until later in the year.

SURFACE-BASED FIELD TESTING

The drilling of the first three Nye County Early Warning Drilling Program (EWDP) Phase IV wells ended during this reporting period. Further drilling is scheduled to commence in mid-April 2003. Repository integrity monitoring continued during this period.

LABORATORY STUDIES

The tests on radionuclide transport in saturated and non-saturated, non-welded, tuff at Atomic Energy of Canada, Ltd., laboratories have been concluded. The tuff blocks are being radiometrically analyzed and investigations are being conducted as to the cause of chemically reducing conditions in the saturated block. There are currently no ongoing tests at the Atlas facility, however, a thermal management dispersion test at the Atlas facility is pending.

UPCOMING NEW TESTS AND STUDIES

Geotechnical sampling and tests will soon be underway at the Pena Blanca, Mexico, site (natural analog program). Also planned for Fiscal Year (FY) 2003 is deepwater well drilling in Inyo County, California, and construction of Alcove 10 in the ECRB.

REPORT DETAILS

INTRODUCTION

The principal purpose of the OR report is to inform NRC managers, staff, and contractors of information on the DOE programs in repository design, performance assessment, performance confirmation, and environmental studies, that may be useful in fulfilling NRC's role during prelicensing consultation. The primary focus of this and future OR reports will be on DOE's programs for subsurface- and surface-based testing, performance assessment, data management systems, and environmental studies. Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to pursue the LA. The ORs also take part in activities associated with resolving NRC KTIs. This report covers the period of January 1, 2003, through February 28, 2003.

OBJECTIVES

The ORs mission is to serve principally as a point of prompt information exchange and to identify preliminary concerns with site investigations and potential licensing issues. The ORs carry out this role by gathering and evaluating information, identifying concerns, and raising more significant issues to NRC management's attention. Communication with DOE is accomplished by exchanging information on data, plans, schedules, documents, activities and pending actions, and resolution of issues. The ORs interact with DOE scientists, engineers, and managers, with input from NRC Headquarters management, regarding the implementation of NRC policy, programs, and regulations. The ORs also focus on such issues as QA, design controls, data management systems, performance assessment, and KTI resolution. A primary OR role is to identify areas in site studies, activities, or procedures that may be of interest or concern to the NRC staff.

1 QA AND ENGINEERING

1.1 Management Improvement Initiatives Confirmation Review Process

On July 19, 2002, the Director of the OCWRM issued the "Management Improvement Initiative" (MII) (PLN-CRW-AD-000009, Revision 0). The MII was developed to address deficiencies in the implementation of the OCRWM quality assurance (QA) requirements to: 1) prevent recurrence of previously identified program implementation inadequacies; and 2) establish a basis for improved performance. The objective of the MII is to ensure that the Office of Repository Development (ORD) technical work products consistently meet quality objectives and are fully defensible. As previously documented in NRC Report OR-02-04, dated October 29, 2002, the staff provided the initial results of their review of the adequacy of the corrective actions associated with the MII.

The MII identified five key areas in which improvements were needed:

- Program Roles, Responsibilities, Authority, and Accountability (R2A2)
- QA Programs and Processes
- Program Procedures
- Corrective Action Program, and
- Safety Conscious Work Environment (SCWE).

Within the MII, the DOE identified specific actions for implementation to achieve improvement in each of the areas listed above, as well as, performance indicators to measure progress and effectiveness. There are 29 action statements associated with the 5 MII key areas. Additionally, there are 12 action statements related to CAR BSC-01-C-001 and 25 action statements associated with CAR BSC-01-C-002 concerning deficiencies in models and software, respectively.

During this reporting period, the ORs evaluated the initial results of the MII CT established by OCRWM to provide a mechanism for determining overall program implementation and MII completion status. The MII identified that a review and closure process would be instituted to ensure the action plans were implemented and effective in improving performance. As part of the MII closure process, reviews by the DOE's OQA and the CT were performed to assess the completion of the MII action statements. In particular, the ORs reviewed six completed confirmation packages conducted by the CT for the action statements listed in Section 5, (SCWE) and Appendix B of the MII.

Based on the results of this review, the ORs determined that the confirmation packages were complete and that the respective action statement responsible managers appropriately signed-off the completed activities. The level of detail included in the confirmation packages was superior and the objective evidence demonstrated the completed actions were clearly identified. No items of concern were identified and it was generally concluded that the confirmation packages established an effective baseline for demonstrating that the MII items have been completed. However, the ORs noted that the CT activities were only intended to document the completion of specific management actions and that the overall effectiveness of the process improvements of the MII has not been established. The ORs also determined that despite the progress made to address the MII issues, 7 of the 25 scheduled actions have not been reported as complete at the end of this reporting period and approximately 50% of the milestones identified in the MII have not been reported as completed on time. Accordingly, the ORs will continue to monitor the implementation of the MII and the development of effective performance indicators.

1.2 Observation of Procedure Development Surveillance OQA-SI-03-014

As stated above, the MII defines general actions for each of the five key areas related to improvements in the implementation of the QA program. Relative to Section 5.3, Program Procedures, the MII states that "Program procedures are typically overly prescriptive and inefficient." The MII also states, in part, that, "In many cases, unnecessary and repetitive administrative requirements.....overcome substantive content and impede work execution." Although the project's DR trend analysis for the previous two years did not identify any cause code examples of procedures that were overly prescriptive or inefficient, the MII corrective actions for this activity specified that BSC would develop and issue new or revised procedures. The project's goal for completing the phased release of the revised procedures was June 2003. However, various implementation issues have resulted in delays in the development of the procedure transition process. A key element in BSC's procedure realignment process was the development of BSC-AP-ATS-0001, "Procedure Development and Use," Revision 0, dated January 21, 2003.

In order to evaluate the effectiveness of the MII program procedure improvement process, the ORs observed selected aspects of DOE's OQA surveillance of the procedure realignment process (OQA-SI-03-014). The purpose of this surveillance was to review BSC-AP-ATS-0001, for compliance with the requirements of the QARD, and examine the comment/resolution process, as well as, the associated document records for this procedure. Additionally, OQA reviewed the structure and hierarchy of quality affecting procedures relative to desktop instructions and guides and the project's methodology for coordinating the transition of procedures jointly implemented by DOE and BSC.

As a result of OQA's review of the procedure change documentation associated with BSC-AP-ATS-0001, numerous errors and omissions were identified including examples of failure to comply with the requirements of the QARD and procedure AP-5.1Q, "Plan and Procedure Preparation, Review, and Approval." Examples of noncompliance with the QA program requirements included the following items: 1) Resolution and/or sign off of review and comments were not documented; 2) Changes were made to the procedure after the reviewer's concurrence; 3) Several review record forms were incorrectly identified as non-Q documents; 4) Review record forms identified the reviewer's concurrence without documented responses for mandatory comments and/or indicating acceptance of responses; 5) Use of blue sheet change notices were not administratively controlled or adequately defined; 6) Numerous errors and omissions were identified during the evaluation of the review record forms for draft revisions A through D; and 7) No review record form was available indicating the satisfactory resolution of comments.

The surveillance team also evaluated BSC's process for the approval and issuance of "blue sheet change notices" to supersede existing procedures. Although not procedurally defined, the blue sheet process involved transferring procedure control from DOE to BSC without material change to the content of the procedures. Based on the results of this evaluation, the surveillance team determined that BSC had bypassed the organizational position responsible for those procedures, including those affecting DOE. Specifically, BSC superseded approximately 97 procedures using the blue sheet process. These blue sheet procedures appeared on the OCRWM program documents database starting on February 10, 2003, and the superseded Administration Procedures (APs) were removed from the active database. Thus, for several days, DOE did not have procedures in effect for the corresponding quality affecting activities. The justification provided on the reviewed blue sheets indicated that this activity was performed to satisfy the objective of Section 5.3 of the MII (i.e., review and revision of procedures to make them more effective and efficient). Significantly, the surveillance team also determined that the signatures in the blue sheet change notice approval blocks, for the approximate 97 affected procedures, preceded the date of preparation and that the forms had apparently been photocopied. Therefore, it appears that the blue sheet change notices were not only signed in advance of obtaining the preparer's signature, but that the signature was potentially applied to a blank blue sheet form that was duplicated prior to the documents' preparation.

Additionally, the OQA surveillance team identified numerous inaccuracies and areas of noncompliance during the detailed review of the Implemented Requirements Matrix for procedures BSC-AP-ATS-0001. Elements of the QARD requirements which were not appropriately addressed in BSC-AP-ATS-0001 included: 1) failure to identify the process to revise implementing documents based on revisions to the QARD; 2) reference to

procedure AP-2.14Q, “Review of Technical Products and Data,” for the review process, which does not meet program requirements for procedure reviews; 3) Section III, of this BSC procedure, fails to identify most of the required information in QARD 5.2.2 related to Content of Implementing Documents; 4) establishment of an effective date for approved implementing documents not properly addressed; 5) method for incorporating changes inadequately addressed; 6) preparation and maintenance of the document not properly addressed; and 7) inadequate procedure change control provisions.

During the conduct of the surveillance, OQA also identified a potential SCWE issue involving a situation where BSC document control review personnel were apparently directed to complete the record package for procedure BSC-AP-ATS-0001, without obtaining the requisite concurrences on the various draft versions of the document. Specifically, the BSC document review personnel identified several inconsistencies in the review package and apparent examples of a procedural noncompliance. Despite the identification of these concerns, regarding the adequacy of the document records package, BSC management apparently directed the issuance of BSC-AP-ATS-0001. The surveillance team further determined that following the completion of the sign off for the resolution of comments, the BSC QA reviewer documented several concerns related to the procedure that this individual had concurred with. Although there was an indication that schedule pressure was a factor in the BSC QA sign off process, this SCWE issue was not addressed by OQA because it was determined to be outside the scope of the surveillance.

Coincident with OQA’s evaluation of the procedure transition process, BSC QA initiated a DR on February 12, 2003, that addressed the following issues: 1) Blue sheets were not approved by the responsible organization; 2) Blue sheet blanket approval signature precedes the date of preparation; 3) AP-5.1Q was erroneously superseded while quality affecting work was continuing under that procedure: and 4) Issued blue sheets were incorrectly designated as non quality related documents. On February 13, 2003, the blue sheet change notices were withdrawn by BSC and the OCRWM Program Procedures Database (OPPD) reverted to the procedures in effect prior to February 10, 2003, with the exception of AP-5.1Q, “Plan and Procedure Preparation, Review, and Approval,” and BSC-AP-ATS-0001, which as of February 27, 2003, retained its blue sheet. It was also noted by the OQA surveillance team that the OPPD does not accurately reflect the status of the blue sheets that were issued and subsequently rescinded in the canceled/superseded OPPD database.

Based on the safety significance of these issues, OQA initiated a SWO No. BSC (O)-03-C-097, on March 4, 2003. As stated in the SWO, “BSC-AP-ATS-0001, Revision 0, “Procedure Development and Use” was not developed and processed in compliance with the requirements of AP-5.1Q, Revision 3, ICN 3, “Plan and Procedure Preparation, Review, and Approval.” Furthermore, the procedure fails to adequately implement OCRWM QARD requirements for the development of procedures.” On this same day, BSC provided a written acknowledgment to DOE, which described their action to stop work on BSC procedure BSC-AP-ATS-0001, Revision 0, and any procedures under development using this process.

Subsequent to the issuance of the SWO, OQA initiated CAR No. BSC (O)-03-C-097. This CAR documented that contrary to the requirements of the QARD and AP-5.1Q, BSC failed to effectively implement the procedure development processes defined in

AP-5.1Q, during the preparation, review and approval of BSC-AP-ATS-0001, and related processing of procedures. The CAR also concluded that procedure BSC-AP-ATS-0001, was not acceptable for use based on the significant condition adverse to quality identified by OQA's surveillance team.

The ORs reviewed the documentation associated with this issue including the SWO, CAR BSC (O)-03-C-097, and the related DRs. The ORs also discussed the relevant issues with the surveillance team and participated in the team meetings. Based on the results of these interactions and independent review efforts the ORs generally concur with the results of the OQA surveillance team. However, it was noted that three significant issues identified by the surveillance team were not specifically addressed within the context of CAR BSC (O)-03-C-097. These issues involved: 1) identification of the lack of procedural training (QARD 2.2.12, Personnel Training) as a contributing factor; 2) failure of BSC to develop an effective transition plan in accordance with the requirements of QARD 2.2.5, "Planning Work;" and 3) an apparent SCWE issue related to the release of a quality affecting document with known errors and potential procedural deficiencies. As indicated by the director, OQA, these issues were distinct from the identification and resolution of the procedural inadequacies related to BSC-AP-ATS-0001 and that these deficiencies, if validated, would be addressed in separate DRs or management actions. Therefore, pending the documentation of these issues on separate DRs and the effective resolution of concerns related to inadequate personnel training, the failure to establish an effective transition plan, and the evaluation of SCWE issues, this item is identified as **OR Open Item 03-01**.

1.3 MII Completion Status

There are 29 discrete action statements associated with the 5 MII action plans. Additionally, there are approximately 36 action statements related to CARs BSC-01-C-001 (Models) and BSC-01-C-002 (Software). Based on the MII schedule, 25 of these actions were to be completed by December 2003. The project has indicated that 18 of those actions have been reported complete, and that 7 of those have satisfied the confirmation review process. However, seven of the scheduled actions have not been reported complete as of the end of January 2003. These incomplete actions for 2003, are as follows:

- Roles, Responsibilities, Authority and Accountability (R2A2) (four items)
  - DOE, Staff Orientations to Alignment (forecast completion - End of February)
  - BSC, Staff Orientations to Alignment (tied to DOE Action above)
  - DOE, Program Manual Providing Implementation Requirements (tied to DOE Action above)
  - DOE, Revise Performance Appraisals to reflect QA R2A2 (forecast for completion - End of February)

- QA Program Processes (two items)
  - DOE, QARD Review and Revision (forecast for completion - End of February)
  - DOE, Revise Performance Approval to reflect QA R2A2 (forecast for completion -End of February)

- Program Procedures (one item)
  - DOE, Review Respective Procedures and Define Hierarchy (no forecast completion date)

As of the end of January 2003, only about 50% of the milestones established in the MII were reported complete on time, and the percentages of action statement summary sheets submitted as final for DOE and BSC were approximately 30% and 50%, respectively. Enhanced performance indicators associated with the MII are still under development by the project.

Corrective actions related to CARs BSC-01-C-001 and BSC-01-C-002 are behind schedule. The management imposed stand-down on software development, which has been in effect for approximately 18 months, remains in place with no established date for conclusion. CAR BSC-01-C-001, has been open for more than 640 days, and has 4 actions that are overdue. Specifically, 7 of the 12 actions associated with this issue have been completed and verified by OQA. Four action items are in process with the responsible manager and one is in the OQA verification process. However, OQA noted that there may be insufficient objective evidence regarding this item to justify complete verification at this time. The ORs noted that, although two of the four open action items are forecast for closure in the near future, the remaining two items concerning the effectiveness of self-identified issues and the evaluation, and impacts of Bin 3 Models, are significantly behind schedule. These issues may require additional management attention, and it is anticipated that they will be discussed during the next Quarterly QA meeting, scheduled for April 29, 2003.

CAR BSC-01-C-002, is more than 600 days old, and has 25 discrete actions associated with its completion, 15, of which, are overdue. As of the end of January 2003, nine actions have been completed and verified as satisfactory; eight actions have been reported as complete, and are ready for verification/confirmation; six actions are in progress with the responsible manager; and one action concerning the performance of a self-assessment has not started.

Although effective self-identification of deficiencies is an implicit aspect of the MII, current indications are that items identified by line organizations have declined from the targeted value of 50%. The current value for self-identified items is approximately 25%. There also appears to be a high threshold and a reluctance to document nonconformances on DRs. Recent examples include: 1) the hesitancy of the project to issue a DR related to the deviation from the annual audit requirements defined in the QARD (Yucca Mountain Site Characterization Office audit); and 2) the hesitancy to document a procedural noncompliance with the requirements of the QARD pertaining to the use of unqualified data directly relied on to address safety and waste isolation issues without being qualified.

1.4 OR Report Open Items Review

During this reporting period, DOE provided additional information on the following OR Open Items. The ORs reviewed this information and the results are documented below.

OR Open Item 02-02 identified that current process controls specify one (or more) of nine criteria may be utilized to validate a model. Although all of the criteria should increase confidence in the modeling process, some of the criteria, by themselves, do not appear to be appropriate for addressing whether the model is valid for its intended use.

In response to this issue, the project stated that model validation requirements incorporated into AP-SIII.10Q, "Models," are applied in two steps. AP-SIII.10Q, Section 5.4.1 (b) states that the originator will document confidence-building activities completed while the model is in development. AP-SIII.10Q, also requires the originator to address confidence derived from input selection, from initial condition/boundary runs and/or run convergences, as well as any decision or activity that caused the model developer to

have increased confidence in the model outcomes. AP-SIII.10Q, Section 5.4.1 (c) lists confidence-building activities to be applied after the model has been developed and model results are available. Furthermore, Section 5.4.1 (c), states that one or more of the seven post development model validation activities must be applied.

The number and the nature of the post development model validation activities are determined by the intended use and the level of confidence needed in the model based on the model's relative importance to safety. Additionally, project training emphasizes that corroboration of model outcomes with external and/or Project data (not used to develop the model) is the preferred method for model validation. Originators of models for which corroborating data is unavailable, or limited, may choose other corroborating methods or may choose independent review. Originators may also choose to complete multiple post development model validation activities. AP-SIII.10Q, Section 5.4.1 (d), further states that originators may document additional confidence derived from publishing in refereed journals, or from documentation prepared by external agencies/entities; however, they must have also completed one or more of the activities described in Sect 5.4.1 (c).

It was also stated that the BSC Projects Office and the BSC Chief Science Office work together to ensure that models undergo adequate "confidence-building" activities. Model validation plans are developed and approved in the Technical Work Plan (TWP), prepared in accordance with AP-2.27Q, "Planning for Science Activities." The TWP is reviewed by the line management (Projects Office) and by the Chief Science Office (independent of line). The purpose of the review is to ensure that the model will undergo sufficient "confidence-building," based on its intended use and relative importance to safety. If the plans are not judged to be sufficient to obtain the needed level of confidence, other post development activities are identified and approved. Plans that identify corroboration with alternative models are reviewed by project personnel to ensure that the comparison model is robust and is well documented. Plans for independent technical review and AP-2.12Q, "Peer Review" are evaluated to ensure that the review will, in fact, be effective and enhance confidence in the model outcomes.

The project's current position is that these validation requirements are consistent with past NRC guidance on model validation contained in NUREG 1636, "Regulatory Perspectives on Model Validation in High-Level Radioactive Waste Management Programs." The project further indicated that appropriate controls (validation planning in the Technical Work Plan, independent review by Chief Science Office, formal checking, inter discipline review) are in place to ensure adequate confidence will be provided for models supporting the LA.

Based on the ORs review of the amplifying information provided by DOE, it was determined that the response adequately addressed Open Item 02-02. The NRC plans to evaluate approved TWPs to verify that the model validation criteria being utilized by the DOE are appropriate based on the intended use and the model's relative importance to safety. DOE also indicated that the training program emphasizes that corroboration of model outcomes with external and/or project data (not used to develop the model) is the preferred method for model validation. Anticipated evaluation of approved technical work plans will verify whether the training expectations and the philosophy to model confidence expressed by the Chief Science Office are being appropriately implemented in DOE products. Revision to AP-SIII.10Q, has addressed the original NRC concern where a model could have been considered to have adequate confidence simply by

publication in a refereed journal. Therefore, OR Open Item 02-02 is considered closed.

OR Open Item 02-03 documented that the more objective criteria (e.g., comparison to data not used in the development of the model), that typically results in higher confidence in model validation are not distinguished from the more subjective, and thus problematic criteria (in the written materials).

In response to this issue, DOE provided the clarification that procedure AP-SIII.10Q, does not explicitly state that corroboration with data is the preferred method for model validation. However, DOE indicated that this process is a management expectation in the TWP review process, procedure training activities, and in the Scientific Processes Guidelines Manual, Revision 01 (WIS-MIS-MD-000001). Specifically, procedure AP-SIII.10Q, states that data used to develop (or calibrate) the model may not be used to complete post development model validation. Calibration, initial condition/boundary runs and run convergence are documented as a part of validation completed while the model is in development. Therefore, corroborating data may be unavailable, or limited, for some models. Corroboration with parent models is a suggested path for post development validation of abstracted models. Originators of theoretical or performance assessment models may choose to corroborate outcomes with model outcomes documented in literature or in external agency/organization reports. Because some models require the use of validation methods other than corroboration with data, the project does not believe it is appropriate to make a generic statement that data comparison is the preferred option for post development validation. Rather, it is most appropriate to offer the range of options needed to build confidence across the wide range of models used to support the potential License Application (LA).

Based on the review of the Scientific Processes Guidelines Manual, the ORs were unable to confirm that this document specifically identified that corroboration with data is the preferred method for model validation. The ORs were also unable to substantiate that this expectation was explicitly conveyed to participants based on the review of the relevant training materials. However, the Chief Science Office (CSO) and the individuals responsible for providing the training, indicated that the expectation of corroboration with data is the preferred method for model validation, and was clearly articulated during the training process. This approach would be reflected in approved TWP's. Pending the review of CSO approved TWPs, and confirmation that corroboration with data is the preferred method for model validation, OR Open Item 02-03 remains open.

OR Open Item 02-04 identified that a number of criteria have been developed related to various forms of review. If a review is relied upon for model validation, it should be directed at validating the model and it should encompass the full body of information to the extent practical, (e.g., references, alternative models, supporting documents).

In response to this item, DOE indicated that originators who use independent technical reviews or AP-2.12Q, "Peer Review," to complete post development model validation are instructed to identify the following in the TWP:

- Skills of their viewers (skills must be “value added” to the confidence in the model outcomes)
- The criteria to which the reviewers will evaluate the model
- Documentation to be given to the reviewers (ensures all available information is presented)
- Any required project training

The bullet information is also documented in the final product in Section 7 of the Analytical Model Report (AMR). The names of the reviewers, review criteria, comments, and comment resolution documentation are retained by the project as quality-affecting and federal records.

The review of the DOE response to OR Open Item 02-04 indicates agreement with the NRC concern and that documentation will be produced to show that reviewers were appropriately trained, what criteria they used, and the documentation that was provided to them to perform their review. Specifically, the ORs determined that the project has established expectations for the individuals performing the review, which will be adequately reflected in training or other materials. Therefore, OR Open Item 02-04 is closed.

OR Open Item 02-05 identified provisions are in place that allow for model validation to continue past the issuance of the documentation. While additional information to further support models is beneficial, the models used in the performance assessment should have adequate support for their representation at the time the performance assessment documentation is issued.

In response to this issue, DOE stated that the option to plan forward post development model validation will largely be used by those in the Scientific Investigations/Testing Department, who are tasked with preparing predictive models for investigations/tests that have not been initiated or have not been completed. DOE further noted that it is expected that these predictive models will only be validated when the test outcomes are available. Therefore, the post development model validation activity must be planned forward until outcomes are obtained. Using this approach, DOE asserted that it will be rare that they would project additional model validation beyond completion of the LA documentation for other types of models.

Based on the review of DOE’s response to Open Item 02-05, the ORs determined that some additional model validation activities may continue beyond the completion of LA documentation. Specifically, the DOE response does not indicate those other model validation criteria, (in lieu of comparison to the test/field data being developed in an investigation) would be used to ensure that all models used in the performance assessment have an adequate level of confidence at the time of LA. Therefore, pending further clarification, relative to this issue, OR Open Item 02-05 remains open.

OR Open Item 02-06, documented the NRC staff’s determination that information originally classified as “unqualified data” was being changed to “assumptions.” The current project procedures allow this practice and the result is closure of the associated

data qualification issues. However, it was not apparent how this process would appropriately represent the uncertainty associated with the unqualified data.

DOE's response to this issue indicated that consideration of unqualified data should be a factor during the evaluation of information related to the uncertainty and variability of qualified data sets. Specifically, DOE stated that for model validation purposes, all sources of information and data may be used for corroboration of model results per AP-SIII.10Q. DOE also indicated that, guidance on this topic has been provided and Appendix A in the Scientific Processes Guidelines Manual, provides information to modelers/analysts about how to incorporate uncertainty into their products. This appendix was provided to improve the level of consistency in the LA technical products with regard to treatment of uncertainty. DOE also indicated that the Total System Performance Assessment-License Application (TSPA-LA) Methods and Approach (TDR-WIS-PA-000006, Rev 00, Sept 2002) contains a discussion of approaches to uncertainty analyses (Section 8), as well as earlier sections on forms of uncertainty (Section 3).

Based on the NRC staff's review of the documents referenced in DOE's response to this item, it was concluded that insufficient information had been provided to adequately address the issues identified in OR Open Item 02-06. Specifically, the staff determined that although the documents referenced by DOE generally discuss data uncertainty, they do not address the replacement of unqualified data with an assumption, or with qualified data. The staff also noted that there was insufficient consideration of the impact on data uncertainty reflected in the performance assessment. Therefore, pending the development of an appropriate response to this issue, OR Open Item 02-06 remains open.

OR Open Item 02-07 identified that the model validation impact assessment addressed the effect of inappropriately validated models on TSPA-SR. In many cases these impact assessments used TSPA-SR results to evaluate the local impacts. It is unclear how this practice evaluated the cumulative impacts of all the models in question, any potential synergies between different models, and additional uncertainty associated with using models having inadequate confidence.

In response to this issue, DOE stated that a number of sensitivity studies have been completed since November 2001 Model Validation Status Review (see Risk Information to Support Prioritization of Performance Assessment Models, for example, TDR-WIS-PA-000009, rev 01, ICN 01). These studies generally provided confidence that the work performed for the Site Recommendation was fully defensible. The project's position is that they have demonstrated a good understanding of the synergies between models and the uncertainties in models. The project also indicated that they are confident the cumulative impact of the uncertainties in the models that were judged to have inadequate confidence (Bin 3) on 10,000 years predicted doses and uncertainties in those doses is minimal. This will be confirmed by comparison of the Site Recommendation results with the results of TSPA-LA, which will be developed using models that are valid for their intended purposes and fully qualified software. An independent review to assess cumulative impacts of Bin 3 models, prior to completion of TSPA-LA, is also under consideration.

As stated by DOE the model validation impact assessment was completed to evaluate if there were any significant impacts to the site recommendation model conclusions resulting from the determination that some models did not have adequate confidence according to then current project QA procedures. The NRC concern was that the analyses performed for the Bin 3 model validation impact assessments were lacking, and that it was unclear that one could conclude there was no significant impact. Analysis for the combined effect of uncertainties in Section 3.4 of the Risk Prioritization Report does provide some indication that the impact from Bin 3 models was likely not large. However, the Risk Prioritization Report was not directed at evaluating Bin 3 models and analyses directed at the combined effect of uncertainties for the Bin 3 models has not been completed. Comparison of the TSPA-SR model results to the TSPA-LA model (which will meet model confidence requirements) would provide the appropriate technical argument, but would no longer be timely. Therefore, DOE should reasonably explain how the model validation impact assessment was or was not technically adequate, considering the original NRC concerns expressed in OR Open Item 02-07. DOE should also discuss the timeliness of the QA requirement for an impact assessment. Therefore, pending further clarification of this issue, OR Open Item 02-07 remains open.

2. OUTREACH ACTIVITIES

2.1 Clark County Yucca Mountain Nuclear Waste Advisory Committee Meeting

On January 16, 2003, an OR attended the periodic public meeting of the Clark County Yucca Mountain Nuclear Waste Advisory Committee Meeting. Items discussed included DOE progress, transportation issues, and citizen public outreach on High-Level Waste (HLW) transportation and disposal issues.

2.2 DOE Affected Units of Government Meeting

On January 29, 2003, an OR attended a public meeting held by DOE OCRWM management (M. Chu and J. Arthur) in Las Vegas with representatives of the affected units of government (AUGs). Represented were all counties in Nevada, Inyo County in California, and the State of Nevada. A representative from Senator Ensigns' office and a representative from the City of Las Vegas were also present.

The new DOE organization, changes in management personnel, and DOE's transportation program organization were described. J. Arthur indicated that he would be traveling to the different counties to meet with local representatives. He also indicated that DOE will be updating their web site to allow the public to track progress on the project. Based on his experience with the Waste Isolation Pilot Project (WIPP), J. Arthur then went on to detail some of the positive impacts on the local jurisdictions in New Mexico from the WIPP project.

The questions/concerns from the AUGs centered around: 1) funding for their oversight activities in light of the continuing resolution; 2) accelerating the schedule for completion of the transportation Record of Decision; 3) more involvement by the AUGs in the

transportation planning process; 4) concern about a disconnect between the Nevada and National transportation planning; and 5) with the LA on the fast track priority for 2004, can the project keep pace on the transportation plans, etc.

Other county concerns dealt with continued confusion as to who regulates transportation of HLW, the potential stigma from the disposal of HLW in the State and the impact on tourism, planning and funding for accident and emergency response, and the use of DOE oversight funds to attend out of state conferences and tours (some tours involve visits to other NRC regulated facilities).

3 FIELD AND LABORATORY TESTING

3.1 General Issues

Electrical Work Safety Stand-down

On January 9, 2003, a standing order was issued by the Site Operations Project Manager giving notice of a safety stand-down for all electrical work at the Yucca Mountain site. The stand-down was related to safety and quality concerns and resulted in the project having to furlough 15 of the 19 electricians at the site. The stand-down will be lifted gradually as new electricians complete an enhanced worker qualification program. This issue is related to two other work stand-downs that occurred in 2002. One was a near miss electrical incident last spring and circuit lock out tag-out problems last summer. Continued problems with electrical workers not following procedures have lead to the latest stand-down and personnel actions.

Smoke in the ECRB

On January 13, 2003, smoke was detected in the ECRB behind the bulkhead at Station 22+01. The Yucca Mountain Project (YMP) Operations Center was notified, the Emergency Response Organization was activated, and all personnel were evacuated from the tunnel. The Mine Rescue Team was activated and the Nevada Test Site (NTS) Fire Department went to the site and provided standby support.

The Mine Rescue Team entered the ECRB to sample air behind the bulkhead at Station 22+01 and to isolate electrical power that fed equipment behind the bulkhead. From the result of the entry, an action plan was developed to determine the source of the smoke behind the bulkhead. Eventually the Mine Rescue team identified burnt wiring between the bulkheads at Stations 22+01 and 25+01 as the cause of the smoke.

As of the end of this reporting period, the effect of this event has been that there will be a delay in plans to conduct a ventilated entry later this year. Related to this, power to the instruments monitoring the conditions behind the sealed bulkhead at Station 22+01 were turned off on February 13, 2003, to remove the effect of any heat sources behind the bulkhead. The next observations of the sealed portion of the ECRB will be made during the ventilated entry scheduled for sometime later this year.

3.2 ESF Testing

The excavation of the ESF main drift, completed in 1997, allows the collection of scientific and engineering data at Yucca Mountain. DOE continues testing in the ESF main drift to supply data to support DOE's ongoing scientific studies. Figure 1 shows the ESF test locations. Ongoing ESF testing activities are summarized below.

Alcove 5 (Drift-Scale Test)

In accordance with the established DOE test plan, power to the heated drift was turned off in mid-January 2002, and the 4-year cool-down of the facility is being monitored. DOE is performing periodic visual and video inspection, water sampling, gas sampling, neutron logging, and electrical-resistance tomography. The data from this test have primarily been used as input to the Thermal Measurements Analysis Modeling Report (AMR).

Borehole 75, in the drift-scale heater test, has produced unusual water during the cool-down period sampling. DOE characterized the water as discolored (brownish yellow), high in trace metals, chloride (but not fluoride), and sulfur. Conductivity has been measured at 10 to 100 times stronger than other drift-scale test waters. Preliminary results of an investigation have determined that the unusual water is the product of the exposure of packer materials (primarily neoprene) to the thermal environments in the rock surrounding the heater test.

Periodic video inspection of the drift-scale thermal test canisters has also revealed a reddish mark on the seventh canister that has appeared since the initiation of the cool-down phase. Preliminary analyses of the mark indicate that it is primarily iron-oxide. Similar but fainter marks have since been discovered on some of the other simulated waste packages. The cause of these marks is under investigation. The results of the investigation will be documented in the Thermal Measurements AMR.

South Ramp

DOE started preparations for Phase I of a ground support test in the south ramp of the ESF. This new test will be looking at issues related to the use of rock bolts in the drifts of the proposed repository. The Test Plan for ground support testing was issued on February 25, 2003.

3.3 ECRB Testing

The excavation of the ECRB cross drift, completed in October 1998, allows the collection of scientific and engineering data in stratigraphic units that constitute the bulk of the potential repository horizon. DOE continues ECRB testing to supply data to support DOE's ongoing scientific studies. Figure 1 describes the ECRB test locations. ECRB testing activities are summarized below.

Sealed Portion of the ECRB Cross-drift

In an ongoing effort to monitor moisture conditions in the sealed portions of the ECRB, the ECRB bulkheads from Station 22+01 and beyond were closed on November 14, 2001. The bulkhead at Station 17+63 was closed on December 20, 2001. Before the

closure of those bulkheads, project personnel installed enhanced monitoring and collection equipment, including remote cameras and moisture-collection devices, in accordance with the revised test plan. Plastic sheets and drip cloths infused with a pH-sensitive chemical were installed near the crown of the tunnel, and numerous sample bottles were placed to collect possible drips from rock bolts.

DOE reopened the bulkhead at Station 17+63, on June 24, 2002. The main purpose for this entry, which was to last about four months, is to take geotechnical rock property samples and to do a slot test in the lower lithophysal zone between Stations 17+63 and 22+01. The bulkhead at Station 17+63 will be resealed after completion of the sampling and other activities in the ECRB.

The geotechnical rock property coring was completed in August 2002. The slot test was completed in December 2002. The ORs will monitor the geotechnical work to be performed in this section of the ECRB cross drift, and the integrity of the bulkhead at 22+01, until the reestablishment of the bulkhead at 17+63.

3.4 Surface-Based Field Testing

Nye County EWDP

The Early Warning Drilling Program (EWDP) was initiated as part of the Nye County Nuclear Waste Repository Project Office Yucca Mountain Oversight program. The purpose of the EWDP is to establish a groundwater monitoring system to protect the residents of Nye County in Amargosa and Pahrump Valleys against potential radionuclide contamination.

The program is also intended to provide geologic and hydrologic information to DOE's Yucca Mountain program. The targeted area is located in the hydrogeologic system south of Yucca Mountain. The questions planned to be investigated are: 1) the origin of spring deposits; 2) the geology and hydraulic properties of valley-floor sediments; 3) the recharge; and 4) groundwater-flow patterns. By understanding this information, the monitoring system can be better designed to provide early warning of contamination of the water resources of Nye County.

EWDP Phase IV Status

EWDP Phase IV began the week of October 20, 2002, with the abandonment of wells EWDP-5S and -2D. New wells EWDP-16P, EWDP-27P, and EWDP-28P were drilled and completed from October 2002 to January 2003. Drilling on additional Phase IV wells is scheduled to begin in mid-April 2003. Detailed information on these wells (when available) and updates to the status of the Phase IV drilling project can be found at: http://www.nyecounty.com/ewdpmain.htm.

Alluvial Tracer Complex

The Alluvial Tracer Complex (ATC) is a joint Nye County and DOE Cooperative Testing Program to investigate flow and transport properties of the saturated alluvium, using wells drilled as part of the EWDP. Part of the ATC testing program was to include

cross-hole tracer tests at well EWDP-19D/D1, in which tracers would have been introduced via observation wells. Well 19D1, which is located in the deepest zone in the saturated alluvium, was scheduled to be pumped, during those tests, to recover the tracers, through lateral flow from the observation wells. However, these tracer tests are currently on hold since the State Engineer has not renewed permit waivers for the cross-hole test tracers.

Other Surfaced-Based Testing

During this reporting period, DOE continued repository integrity monitoring, using a passive single seismic sub-array at the surface and dropping weights in Alcoves 5, 6, and 7.

3.5 Laboratory Studies

Laboratory Study of Radionuclide Transport in Non-Welded Tuff

Migration experiments with a dye tracer and with radioisotopes were concluded in during the last reporting period. During this reporting period post migration radiometric analysis was initiated on the tuff blocks, and microbiological investigations into the cause of chemically reducing conditions in the saturated block continued.

3.6 Upcoming New Tests and Studies

Pena Blanca (Natural Analog Program)

During this reporting period, an agreement was reached with the University of Chihuahua to contract with a drilling provider in Mexico. The drilling is expected to commence in mid-March 2003.

Inyo County Well Drilling

In FY 2003, Inyo County, California, plans to begin drilling five deep monitoring wells in the county, as part of its Yucca Mountain oversight program. The county's rationale for drilling these new wells is to: 1) evaluate regional groundwater flow through the southern Funeral Mountains; 2) establish structural controls on flow paths and discharge areas; and 3) evaluate potential zones of mixing between the deep regional groundwater systems and the local shallow groundwater systems to the northeast. The county is currently establishing the location of the new wells. Initiation of this project will also likely be deferred for the period of time that is required for the Yucca Mountain Project's FY 2003 affected units of government oversight allocation to be appropriated.

Alcove 10

Alcove 10 in the ECRB is a proposed thermal test on the repository horizon in the cross drift. Given current budget constraints, the project is discussing a path forward.

Atlas Facility

FY 2003 thermal management dispersion testing at the Atlas facility is pending. DOE is drafting a test plan.

4.0 GENERAL ACTIVITIES

4.1 Meetings

NRC/DOE Quarterly QA and Management Public Meetings

On January 22-23, 2003, Office of Nuclear Material Safety and Safeguards (NMSS) staff, including the ORs, met with DOE staff to discuss QA and management issues concerning the DOE Yucca Mountain program. Both meetings were three-way video conferences hosted at NRC Headquarters, with connections to the ORD facilities in Las Vegas, Nevada, and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas. Various stakeholders, including representatives from the State of Nevada, Nye County, and industry attended at NRC and DOE meeting locations. Staff at NRC Region IV and various stakeholders also participated via telecom. The next quarterly NRC/DOE meetings are scheduled for late April in Las Vegas, Nevada.

The purpose of the meeting was to discuss the status of the program at the potential repository site at Yucca Mountain, Nevada. Presentations included the status of: 1) the DOE QA Program; 2) implementation of DOE's MII; 3) Key Technical Issue (KTI) agreement resolution; 4) DOE's Safety Conscious Work Environment Program; and 5) the license application. During each meeting, DOE presented the status of previous action items and NRC agreed to the status. Action items from the January meetings included DOE agreeing to provide the following items: Quality Assurance Requirement Description documents; status of electronic media migration; graded QA results; KTI agreement interaction schedule; and high-level results of the MII for the next quarterly meetings.

NRC/DOE Technical Exchange on Performance Confirmation

On February 26, 2003, staff from NMSS, including an OR, and the Center for Nuclear Waste Regulatory Analyses (the Center) met with DOE staff to discuss their high-level strategy to develop its Performance Confirmation Plan. This was the first of an expected series of meetings related to performance confirmation process. The meeting was a two-way video conference hosted at DOE's office in Las Vegas, Nevada, and connected with NRC Headquarters. Also, the Center staff participated via teleconferencing. Various stakeholders, including representatives from the State of Nevada, Lincoln County, and other affected parties, participated at the DOE meeting location. In addition, representatives from the Nuclear Waste Technical Review Board and NRC's Advisory Committee on Nuclear Waste were there.

Presentations included: 1) defining performance confirmation; 2) decision analysis process used to develop the performance confirmation program - Phase I; 3) decision analysis process used to develop the performance confirmation program - Phase 2; and 4) path forward and documentation. A follow-up meeting is planned for later in the year, after NRC staff has reviewed Revision 2 of DOE's Performance Confirmation Plan, scheduled to be released in late May 2003.

Attendance at DOE Igneous Activity Peer Review Meeting

On February 26, 2003, staff from NRC, including an OR, and the Center observed the DOE's sponsored "Peer Review on the Consequences of Igneous Activity," regarding a

potential repository at Yucca Mountain, Nevada. Members from the State of Nevada, the affected units of local government, representatives of the Nuclear Waste Technical Review Board, the U.S. Geological Survey, and other interested parties also attended. The Peer Review Panel has completed its review of the DOE program, regarding Igneous Activity, with emphasis on the consequences of possible Igneous Activity on a potential repository at Yucca Mountain, Nevada. The purpose of this meeting was to discuss the results of the panel's Final Report.

The panel's report provides DOE with recommendations on additional field work, laboratory investigations, and modeling exercises that the panel members believe should be conducted to resolve concerns related to Igneous Activity, specifically those concerns discussed in Igneous Activity Agreement Items related to magma interactions with the repository, waste package, and waste form. In addition, the panel provided comments and suggestions on work to help resolve the concerns related to volcanic ash redistribution and the probability of igneous activity. Subsequent to final editing, the report will be available on the Yucca Mountain web site (www.ymp.gov).

Based on the results of the interim report, issued in September 2002, DOE has started addressing the panel's suggestions, and interactions are planned with NRC staff to discuss a path forward to close the remaining open items in the area of Igneous Activity. DOE is reviewing the report and will prepare a report in the late April 2003 time frame detailing how it plans to address the panel's comments.

4.2 Site Visits

On January 28, 2003, the ORs conducted a site visit for Commissioner Jeffrey Merrifield, members of his staff, the Director of NMSS, and the Regional Administrator of Region IV. The site visit included access to the exploratory study's facility (main tunnel) with stops that included the drift-scale thermal test, moisture-monitoring stations for infiltration studies, and areas of fracture and fault studies. The group also visited the weapon's test areas of the Nevada Test Site. The Commissioner and his staff found the site visit beneficial and they indicated that the information provided enhanced their understanding of the activities related to the Yucca Mountain Project.

There were no outstanding issues raised as a result of these visits.

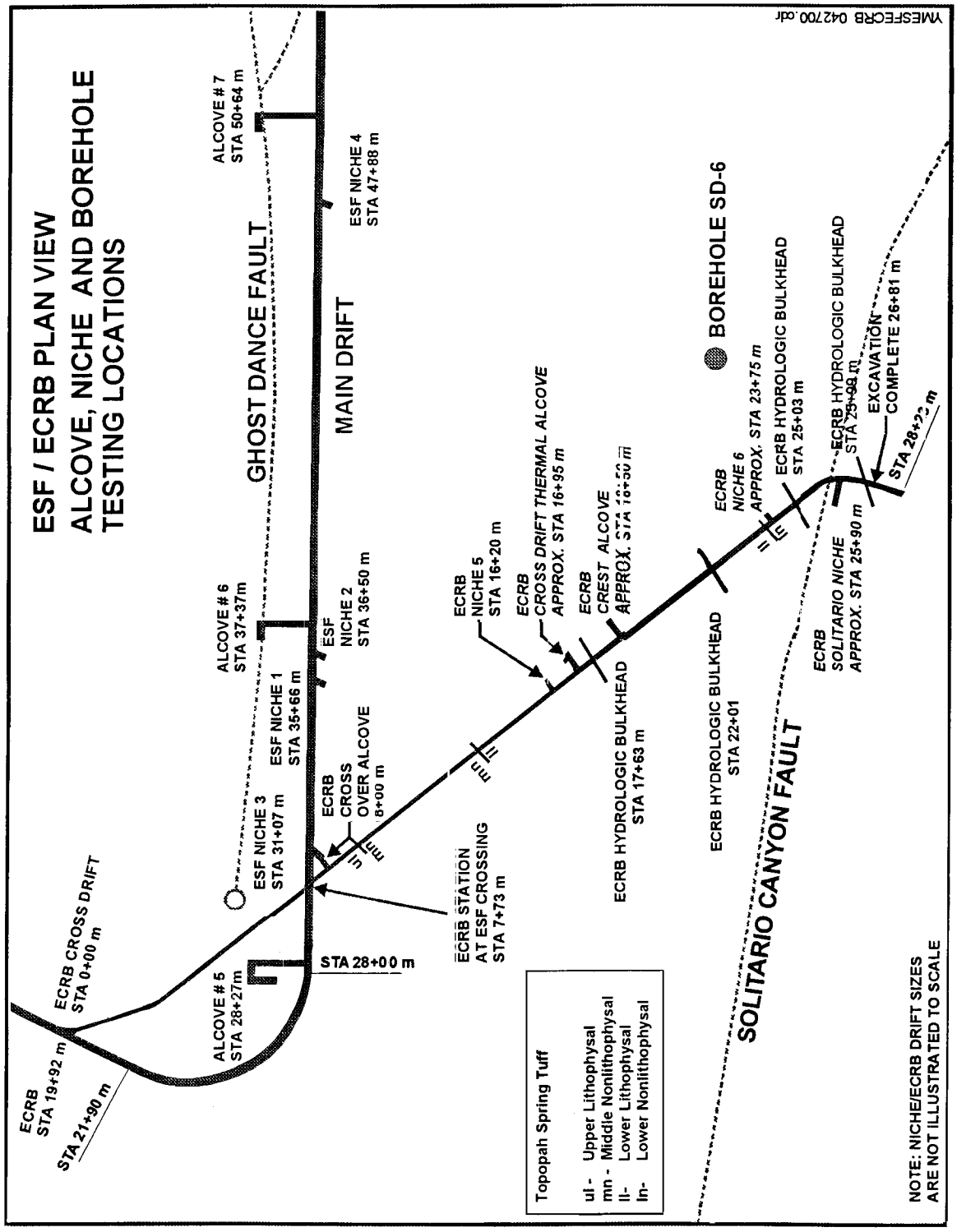
ESF / ECRB PLAN VIEW
ALCOVE, NICHE AND BOREHOLE
TESTING LOCATIONS
GHOST DANCE FAULT
MAIN DRIFT
ECRB CROSS DRIFT STA 0+00 m
ECRB STA 19+92 m
STA 21+90 m
ALCOVE # 5 STA 28+27m
STA 28+00 m
ALCOVE # 6 STA 37+37m
ESF NICHE 3 STA 31+07 m
ESF NICHE 1 STA 35+66 m
ALCOVE # 7 STA 50+64 m
ESF NICHE 4 STA 47+88 m
ESF NICHE 2 STA 36+50 m
ECRB CROSS OVER ALCOVE 8+00 m
ECRB STATION AT ESF CROSSING STA 7+73 m
ECRB NICHE 5 STA 16+20 m
ECRB CROSS DRIFT THERMAL ALCOVE APPROX. STA 16+95 m
ECRB CREST ALCOVE APPROX. STA 16+50 m
ECRB HYDROLOGIC BULKHEAD STA 17+63 m
ECRB HYDROLOGIC BULKHEAD STA 22+01
BOREHOLE SD-6
ECRB NICHE 6 APPROX. STA 23+75 m
ECRB HYDROLOGIC BULKHEAD STA 25+03 m
ECRB HYDROLOGIC BULKHEAD STA 25+90 m
ECRB SOLITARIO NICHE APPROX. STA 25+90 m
EXCAVATION COMPLETE 26+81 m
STA 28+00 m
SOLITARIO CANYON FAULT
Topopah Spring Tuff
ul - Upper Lithophysal
mn - Middle Nonlithophysal
ll- Lower Lithophysal
ln- Lower Nonlithophysal
NOTE: NICHE/ECRB DRIFT SIZES ARE NOT ILLUSTRATED TO SCALE
YMESFECRB 042700.cdr

Figure 1

U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report

(For NRC tracking only) AOI-YMSCO-ARC-02-12-01	Identifies the need for DOE OQA to ensure that procedure development and review process includes a documented evaluation to verify compliance with the requirements of the projects QARD	OR Report No. OR-03-01	Date Item Closed:
OR Open Item 03-01	This Open Item is based on issues on separate DRs: 1) the effective resolution of concerns related to inadequate personnel training; 2) the failure to establish an effective transition plan; and 3) the evaluation of the SCWE issues.	OR Report No.: OR-03-01	Date Item Closed:
OR Open Item 02-13	The current status of corrective & preventive actions associated w/CAR #BSC-02-C-01 revealed that not all corrective actions stated had been complete.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-12	Contrary to requirements of the QARD Supplement III 2.4.Cprocedure AP-SIII.2Q inappropriately allows for the use of unqualified data - BSCQA procedure change control program failed to identify this issue.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-11	Based on surveillance not identifying specific problems w/Soft-ware functionality for codes tested, 7 including NUFT did not pass ITP and/or VTP surveillance.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-10	Pending appropriate evaluation & documentation of the design control attributes associated with requirements of 10CFR §63.44 and Part 21	OR Report No: OR-02-04	Date Item Closed:
OR Open Item 02-09	Pending revision of engineering procedures, to include appropriate design verification considerations.	OR Report No: OR-02-04	Date Item Closed:
OR Open Item 02-08	The required performance of annual audits' justification for delaying a scheduled audit of YMSCO for 3-months with an additional extension does not appear to be adequately supported. - Deviation from requirement of Sub-section 18.2.1 E of the QARD.	OR Report No: OR-02-04	Date Item Closed: **OR Report No.: OR-02-06** **January 23, 2003**
OR Open Item 02-07	Model Validation Impact Assessment - addressed the effect of inappropriately validated models on TSPA-SR. Many cases of impact assessments used TSPA-SR results to evaluate the local impacts. It's unclear how this practice evaluated the cumulative impact of all the models in question.	OR Report No: OR-02-01	Date Item Closed:

U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report

OR Open Item 02-06	Unqualified Data Impact Assessment - NRC staff identified unqualified data that could be replaced with qualified data for the performance assessment. For risk-significant components, an evaluation of unqualified data that is replaced with qualified data would help determine if efforts should be under-taken to qualify the removed data.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-05	Provisions are in place that allow for model validation to continue past issuance of the documentation. The models used in the performance assessment should have adequate support for their representation at the time the performance assessment documentation is issued.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-04	Number of criteria have been developed related to various forms of review. If a review is relied upon for model validation, it should be directed at validating the model and it should encompass the full body of information to the extent practical.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-03-01** **April 14, 2003**
OR Open Item 02-03	More objective criteria (comparison to data not used in the development of the model) typically results in higher confidence in model validation are not distinguished from the more subjective, problematic criteria.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-02	Current process controls specify that one or more of 9-criteria may be utilized to validate a model. All of the criteria should in-crease confidence in the modeling process, some criteria do not appear to be appropriate for addressing whether the model is valid for its intended use.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-03-01** **April 14, 2003**
OR Open Item 02-01	Failure to properly include the specific issues identified in the Concerns Program Final Report in the resolution process may result in not adequately addressing the original employees concern.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-02-06** **January 23, 2003**